

A PROCESSOR WITH A SPLIT STACK**CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims priority to U.S. Provisional Application Serial No. 60/400,391 titled "JSM Protection," filed July 31, 2002, incorporated herein by reference. This application also claims priority to EPO Application No. 03291908.6, filed July 30, 2003 and entitled "A Processor With A Split Stack," incorporated herein by reference. This application also may contain subject matter that may relate to the following commonly assigned co-pending applications incorporated herein by reference: "System And Method To Automatically Stack And Unstack Java Local Variables," Serial No. 10/632,228, filed July 31, 2003, Attorney Docket No. TI-35422 (1962-05401); "Memory Management Of Local Variables," Serial No. 10/632,067 filed July 31, 2003, Attorney Docket No. TI-35423 (1962-05402); "Memory Management Of Local Variables Upon A Change Of Context," Serial No. 10/632,076 filed July 31, 2003, Attorney Docket No. TI-35424 (1962-05403); "Using IMPDEP2 For System Commands Related To Java Accelerator Hardware," Serial No. 10/632,069 filed July 31, 2003, Attorney Docket No. TI-35426 (1962-05405); "Test With Immediate And Skip Processor Instruction," Serial No. 10/632,214 filed July 31, 2003, Attorney Docket No. TI-35427 (1962-05406); "Test And Skip Processor Instruction Having At Least One Register Operand," Serial No. 10/632,084 filed July 31, 2003, Attorney Docket No. TI-35248 (1962-05407); "Synchronizing Stack Storage," Serial No. 10/631,422 filed July 31, 2003, Attorney Docket No. TI-35429 (1962-05408); "Methods And Apparatuses For Managing Memory," Serial No. 10/631,252 filed July 31, 2003, Attorney Docket No. TI-35430

(1962-05409); "Write Back Policy For Memory," Serial No. 10/631,185, filed July 31, 2003, Attorney Docket No. TI-35431 (1962-05410); "Methods And Apparatuses For Managing Memory," Serial No. 10/631,205, filed July 31, 2003, Attorney Docket No. TI-35432 (1962-05411); "Mixed Stack-Based RISC Processor," Serial No. 10/631,308, filed July 31, 2003, Attorney Docket No. TI-35433 (1962-05412); "Processor That Accommodates Multiple Instruction Sets And Multiple Decode Modes," Serial No. 10/631,246 filed July 31, 2003, Attorney Docket No. TI-35434 (1962-05413); "System To Dispatch Several Instructions On Available Hardware Resources," Serial No. 10/631,585, filed July 31, 2003, Attorney Docket No. TI-35444 (1962-05414); "Micro-Sequence Execution In A Processor," Serial No. 10/632,216, filed July 31, 2003, Attorney Docket No. TI-35445 (1962-05415); "Program Counter Adjustment Based On The Detection Of An Instruction Prefix," Serial No. 10/632,222, filed July 31, 2003, Attorney Docket No. TI-35452 (1962-05416); "Reformat Logic To Translate Between A Virtual Address And A Compressed Physical Address," Serial No. 10/632,45, filed July 31, 2003, Attorney Docket No. TI-35460 (1962-05417); "Synchronization Of Processor States," Serial No. 10/632,024, filed July 31, 2003, Attorney Docket No. TI-35461 (1962-05418); "Conditional Garbage Based On Monitoring To Improve Real Time Performance," Serial No. 10/631,195, filed July 31, 2003, Attorney Docket No. TI-35485 (1962-05419); "Inter-Processor Control," Serial No. 10/631,120, filed July 31, 2003, Attorney Docket No. TI-35486 (1962-05420); "Cache Coherency In A Multi-Processor System," Serial No. 10/631,229, filed July 31, 2003, Attorney Docket No. TI-35637 (1962-05421); "Concurrent Task Execution In A Multi-Processor, Single Operating System Environment," Serial No. 10/632,077, filed July 31, 2003, Attorney Docket No. TI-35638 (1962-05422); and "A Multi-Processor Computing System Having A Java Stack Machine And A RISC-

Based Processor," Serial No. 10/631,939 filed July 31, 2003, Attorney Docket No. TI-35710 (1962-05423).

BACKGROUND OF THE INVENTION

Technical Field of the Invention

[0002] The present invention relates generally to processors and more particularly to a processor capable of executing a stack-based instruction set and a non-stack based instruction set.

Background Information

[0003] Many types of electronic devices are battery operated and thus preferably consume as little power as possible. An example is a cellular telephone. Further, it may be desirable to implement various types of multimedia functionality in an electronic device such as a cell phone. Examples of multimedia functionality may include, without limitation, games, audio decoders, digital cameras, etc. It is thus desirable to implement such functionality in an electronic device in a way that, all else being equal, is fast, consumes as little power as possible and requires as little memory as possible. Improvements in this area are desirable.

BRIEF SUMMARY

[0004] Methods and apparatuses are disclosed for implementing a multi-stack processor. In some embodiments, the processor includes a main stack and a micro-stack. The micro-stack preferably is implemented in the core of the processor, whereas the main stack may be implemented in areas that are external to the core of the processor. Operands are preferably provided to an arithmetic logic unit (ALU) by the micro-stack, and in some cases, operands may be fetched from the main stack. By optimizing the size of the micro-stack, the number of operands fetched from the main stack may be reduced, and consequently the processor's power consumption may be reduced.

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2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hiep T. Nguyen whose telephone number is (571) 272-4197. The examiner can normally be reached on Monday-Friday from 9:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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HTN